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10/773,351	02/05/2004	Heidi E. Dixon	18922-08585	6814

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EXAMINER	
CHEN, TE Y	

ART UNIT	PAPER NUMBER
2161	

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/773,351	DIXON ET AL.	
	Examiner	Art Unit	
	Susan Y. Chen	2161	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2/5/2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-34 are presented for examination.

Specification

The disclosure is objected to because of the following informalities:

The instant application comprises a plurality of undefined acronyms such as "ZAP", "QPROP", "NP", "DPLL", "ZCHAFF", "SPROP", "EEE", "EEE*" "SAT", "CNF", etc. Applicant is required to spell out the acronyms at least when it first appears in the disclosure, appropriate correction is required.

Furthermore, the lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 1-34 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-34 of copending Application No. 10/989,982. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-34, are rejected under 35 U.S.C. 102(b) as being anticipated by Ginsberg et al. (hereinafter referred as Ginsberg).

Claim 1:

Franco discloses the claimed database search method, comprising:

formulating the query in terms of the group theory representation [e.g., formulating (or practical) a query (or problem) into propositional logic by using WSAT algorithms at col. 1, lines 31-35, col. 2, lines 17-28 & col. 5, Procedure 2.1];

executing the query on the data in the database within the application domain and encoded in the group theory representation to identify zero or more database elements and group elements in the group theory representation satisfying the query

[e.g, the unit 120, Fig. 2, col. 3, lines 6-15 & col. 5, the Davis-Putman Procedure 2.2; the search engine 210, and sub-search engine 218, Fig. 2 at col. 12, line 60 – col. 13, line 5];

outputting the zero or more database elements and group elements satisfying the query [e.g., col. 5, the Unit Propagation Procedure 2.3].

Claim 2:

Except the limitations recited in claim 1, Franco further discloses that the data within the application domain are represented as one or more augmented clauses, where each augmented clause has a pair (c,G) including a database element c and an associated group G of group elements g acting on c [e.g., col. 5, the Davis-Putman Procedure 2.2 & the Unit Propagation Procedure 2.3, col. 9, the WSAT Procedure 3.3 & the Unit Propagation Procedure 3.4].

Claim 3:

Except the limitations recited in claim 2, Franco further discloses that the group elements g are permutations [e.g., col. 7, lines 12-26].

Claim 4:

Except the limitations recited in claim 2, Franco further discloses that formulating the query in terms of the group theory representation comprises: formulating the query

as a type "find database element c and element g of the associated group G, such that g(c) satisfies property P." [e.g., col. 7, lines 64 – col. 8, line 16].

Claim 5:

Except the limitations recited in claim 1, Franco further discloses that converting the zero or more database elements and group elements satisfying the query from the group theory representation to a native representation of the data within the application domain; and outputting the zero or more converted database elements satisfying the query [e.g., the units: 208, 210, 218, Fig. 2 and associated texts].

Claim 6:

Except the limitations recited in claim 5, Franco further discloses that a database element satisfying the query includes a database element c and a group element g of an associated group G [e.g., the unit: 212, Fig. 2 and associated texts], wherein the converting comprises: constructing g(c) to produce the database element in its native representation [e.g., claims 18].

Claim 7:

Except the limitations recited in claim 1, Franco further discloses that generating one or more low-level queries from the high-level query, wherein the formulating step formulates the low-level queries in the group theory representation and wherein the

executing step executes the low-level queries on the data in the database [e.g., col. 12, line 57-col. 13, line 5 & claim 1].

Claim 8:

Except the limitations recited in claim 7, Franco further discloses that generating one or more additional low-level queries responsive to one or more results of one or more previously-executed low-level queries, wherein the formulating step formulates the one or more additional low-level queries in the group theory representation and wherein the executing step executes the one or more additional low-level queries on the data in the database [e.g., col. 13, lines 50-64 & claims 1-6].

Claim 9:

Except the limitations recited in claim 1, Franco further discloses that representing the zero or more database elements and group elements satisfying the query as a subgroup, wherein some elements are described explicitly and remaining elements are described in terms of the explicitly described group elements [e.g., the grounding and backtrack processing at col. 14, lines 51-65].

Claim 10:

Except the limitations recited in claim 1, Franco further discloses that the data within the application domain describe a digital logical device and wherein the query performs a verification and/or test of the device [e.g., col. 1, lines 29-44].

Claim 11:

Franco discloses a system as claimed, comprising:

a query execution module for executing a query on the data in the database, wherein the data in the database are within an application domain and are encoded in a group theory representation and wherein the query specifies a search for database elements and group elements satisfying a property specified by the query [e.g., the Intelligent searcher & sub-searcher of abstract, the unit 120, 208, 210, etc of Fig. 2 and associated texts].

Claim 12:

Except the limitations recited in claim 11, Franco further discloses that a database construction module for receiving input data within the application domain in a native representation and for encoding the input data in a group theory representation [e.g., the use of WSAT software for receiving data and encoding the data as claimed at col. 3, lines 6-11, Fig 2 and associated texts].

Claim 13:

Except the limitations recited in claim 12, Franco further discloses that the input data in the group theory representation include one or more augmented clauses, where each augmented clause has a pair (c,G) including a database element c and a group G of group elements g acting on c [e.g., col. 5, the Davis-Putman Procedure 2.2 & the Unit

Propagation Procedure 2.3; col. 9, the WSAT Procedure 3.3 & the Unit Propagation Procedure 3.4].

Claim 14:

Except the limitations recited in claim 13, Franco further discloses that the group elements g are permutations [e.g., col. 7, lines 12-26].

Claim 15:

Except the limitations recited in claim 13, Franco further discloses that a query formation module for receiving an input query, the input query specifying a search for database elements satisfying a property in a native representation of the data, and for converting the input query into a search for equivalent database elements and associated group elements in the group theory representation of the data [e.g., col. 5, the Davis-Putman Procedure 2.2 & the Unit Propagation Procedure 2.3].

Claim 16:

Except the limitations recited in claim 15, Franco further discloses the converted input query is of a type "find database element c and element g of an associated group G, such that g(c) satisfies property P." [e.g., col. 7, lines 64 – col. 8, line 16].

Claim 17:

Except the limitations recited in claim 11, Franco further discloses that a result construction module for converting the zero or more database elements and group elements satisfying the query from the group theory representation to a native representation of the data within the application domain [e.g., the units: 208, 210 Fig. 2 and associated texts].

Claim 18:

Except the limitations recited in claim 17, Franco further discloses that a database element satisfying the query includes a database element c and a group element g of an associated group G, and wherein the result construction module constructs g(c) to produce the database element in its native representation [e.g., the units: 208, 210, 218, Fig. 2 and associated texts].

Claim 19:

Except the limitations recited in claim 11, Franco further discloses that a query formation module for receiving a high-level input query, and for generating one or more low-level queries responsive to the high-level input query, the one or more low-level queries specifying searches for database elements and group elements in the group theory representation of the data [e.g., col. 13, lines 50-64 & claims 1-6].

Claim 20:

Except the limitations recited in claim 19, Franco further discloses that the query formation module is further adapted to generate one or more additional low-level queries in response to one or more results of one or more previously-executed low level queries [e.g., col. 13, lines 14-64 & claims 1-6].

Claim 21:

Except the limitations recited in claim 11, Franco further discloses that a result construction module for representing the zero or more database elements and group elements satisfying the query as a subgroup, wherein some elements are described explicitly and remaining elements are described in terms of the explicitly described group elements [e.g., the grounding and backtrack processing at col. 14, lines 51-65].

Claim 22:

Except the limitations recited in claim 11, Franco further discloses that the data within the application domain describe a digital logical device and wherein the query performs a verification and/or test of the device [e.g., col. 1, lines 29-44].

As to claims 23-34, these claims recites the same features as claims 11-22 in form of computer program product, hence are rejected for the same rational.

Conclusion

To expedite the process of re-examination, the examiner requests that all future correspondences in regard to overcoming prior art rejections or other issues (e.g. 35 U.S.C. 112) set forth by the Examiner prior to the office action, that applicant should provide and link to the most specific page and line numbers of the disclosure where the best support is found (see 35 U.S.C. 132).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

1) Forster et al. (U.S. Patent No. 6,601,058) which discloses a system explores stored data via a query that is transformed into a set program having at least one operation structure corresponding to the query operator for handling all data access and storage associated with the operation.

2) Franco et al. (U.S. Patent No.6,912,700) which disclose a system for solving non-linear Boolean equation function by developing at least one inference regarding the Boolean function and save the inference to a state machine via heuristic algorithm to determine whether the Boolean function is satisfiable.

3) De Moura et al. (U.S. Publication No. 2004/0019468) which discloses a system to combine decision procedures with satisfiability solvers.

4) Preston et al. (U.S. Publication No. 2003/0046061)) which discloses apparatus for automatically generating source code from one or more defined functions in accordance with an input statement entered in natural language.

Points to Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan Y. Chen whose telephone number is 571-272-4016. The examiner can normally be reached on Monday - Friday from 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Susan Y Chen
Examiner
Art Unit 2161

September 11, 2006 Susan Chen